

NEW LITHOBII FROM CALIFORNIA AND OREGON.

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Since Dr. Anton Stuxberg published his *Lithobioidea Americae Borealis* in 1875, very little has been added to our knowledge of the Lithobii of the Pacific coast region. A study of somewhat extensive collections made at various points in California and Oregon during 1902 enables me now to present descriptions of ten species not previously recorded, as well as to identify with certainty various species described by earlier writers. In the key which follows I have included, in addition to the new forms, also such other related species as seemed proper for purposes of comparison:

Analytical Key to Species Considered.

A.—Coxal pores in several series (Bothropolys).

a_1 .—Angles of the 9th, 11th and 13th dorsal plates produced.

b_1 .—Articles of antennæ 28–31; pairs of ocelli 30; coxal pores round or oval; length 15–18 mm., width 2.2 mm.; length of anal legs 6 mm., . . . *aztecus* Humb. et Sauss.

b_2 .—Articles of antennæ 42–46; pairs of ocelli 16–21; coxal pores strongly transverse (adults); length 22–23 mm., width 3.3–3.4 mm.; length of anal legs 10.5 mm.,
chumasanus sp. nov.

a_2 .—Angles of none of the dorsal plates produced.

b_1 .—Articles of antennæ 20; pairs of ocelli 7–9 in 2 series; prosternal teeth 6–6; spines of anal legs 1, 4, 3, 1–1, 4, 3, 2; length 18 mm., . . . *monticola* Stux.

b_2 .—Articles of antennæ 23–27 (normally); pairs of ocelli 17–21 in 4 or 5 series; prosternal teeth 8–8 to 13–13; spines of anal legs 1, 3, 2, 1; length 20–24 mm.,
sierravagus sp. nov.

B.—Coxal pores in a single series (Lithobius).

a_1 .—Angles of the 9th, 11th and 13th dorsal plates produced.

b_1 .—Articles of antennæ 26–28; prosternal teeth 2–2; posterior coxæ unarmed laterally; spines of penult legs 1, 3, 3, 1, of anal 1, 3, 2, 1 *angelus* sp. nov.

b_2 .—Articles of antennæ 39–44; prosternal teeth 4–4; posterior coxæ armed laterally; spines of penult legs 1, 3, 3, 2, of anal 1, 3, 3, 1, *bellulus* sp. nov.

a_2 .—Angles of none of the dorsal plates produced.

- b*₁.—Posterior coxæ unarmed with spines; ocelli 6 in 2 series; porigerous area of coxæ deeply depressed, pores 3, 4, 4, 3; anal legs of ♂ conspicuously compressed sublaterally, without produced lobes; length 8 mm.,
remex sp. nov.
- b*₂.—Posterior coxæ armed laterally (porigerous area of last coxæ not deeply depressed).
- e*₁.—Last 3 pairs of coxæ laterally armed.
- d*₁.—Ocelli 8–12; spines of first legs 1, 2, 1, of penult 1, 3, 3, 0–1, 3, 3, 1, of anal 1, 3, 3, 0; length 7.5–9 mm., *eigenmanni* Boll.
- d*₂.—Ocelli 12–15; spines of first legs 2, 3, 2, of penult 1, 3, 3, 2, of anal 1, 3, 2, 0; length 11.5–13 mm., *pitophilus* sp. nov.
- c*₂.—Last two pairs of coxæ laterally armed.
- d*₁.—Anal legs in ♂ not specially modified; claw of ♀ gonopods tripartite; coxal pores 2, 2, 3, 3–3, 3, 4, 3, very small; spines of first legs 1, 2, 1, of anal 1, 3, 3, 1; length 8–8.5 mm.,
sastianus sp. nov.
- d*₂.—Anal legs in ♂ not specially modified; claw of ♀ gonopods tripartite; coxal pores 3, 4, 4, 3–4, 5, 4, 4, large; spines of first legs 1, 3, 1, of anal 1, 3, 2, 0; length 9–10 mm.,
meschinus sp. nov.
- d*₃.—Tibia of anal legs in ♂ produced above into a large peculiar lobe at distal end; (♀ unknown); coxal pores 2, 3, 3, 2, small; spines of first legs 1, 3, 2–2, 3, 2, of anal 1, 3, 2, 0; length 8.8 mm., *castellopes* sp. nov.
- d*₄.—Tibia of anal legs in ♂ produced into a conspicuous lobe at the superior-interior angle of proximal end; claw of ♀ gonopods tripartite; coxal pores 3, 4, 4, 3, moderately large; spines of first legs 1, 3, 2, of anal 1, 3, 2, 0–1, 3, 2, 1; length 10.5–11 mm.,
clavigerens sp. nov.
- d*₅.—Tibia of anal legs in ♂ excavated within near proximal joint, at which it and femur are produced inward into a conspicuous lobe; claw of ♀ gonopods tripartite; coxal pores 2, 2, 2, 2,–2, 3, 3, 3, small; spines of first legs 1, 2, 1,–2, 3, 2, of anal 1, 3, 2, 0; length 7.5–11 mm., *utahensis* Chamb.
- d*₆.—(♂ not known.) Claw of ♀ gonopods entire; coxal pores 2, 3, 3, 3; spines of first legs 1, 2, 1; of anal 1, 3, 2, 1; length 13 mm., *obesus* Stux.

1. *Lithobius chumasanus* sp. nov.

Description.—Adults deep-brown to mahogany, legs paler distally, antennæ paler distally or not; robust, head and dorsum roughened, more strongly so caudally; entire body rather sparsely pilose with very short hairs, but the last ventral plates more densely provided with longer hairs; antennæ on basal joints very sparsely, elsewhere subdensely, clothed with straight stiff hairs; legs sparsely hirsute, the last tarsal joint of anterior legs more densely so beneath. Head rounded, very nearly equal in length and width. Antennæ moderate, articles 42–46, except the first ones short, the ultimate in length about equaling the two preceding together. Ocelli on each side 16–21, arranged in 4 or 5 longitudinal series, large and distinct, the single ocellus very large and vertically oval. Prosternal teeth 6–6, 7–7, large and subequal. Spines of first legs 2, 3, 3; penult legs with two claws, spines 1, 3, 3, 1; anal legs with two claws, spines 1, 3, 3, 1; last 3 pairs of coxæ armed laterally and also dorsally with a stout spine. Coxal pores 7, 8, 8, 6–8, 8, 8, 7, transverse, oval in immature specimens. Gonopods of ♀: claw stout, bipartite, the lobes equal or nearly so, sometimes with a very small third lobe on the inner side of claw; basal spines, stout, pointed, flattened distally.

Length of body 22–23 mm.; width of 8th dorsal plate 3.3–3.4 mm., length of antennæ 10 mm.; length of anal legs 10.5 mm.

Habitat.—Santa Barbara, Cal.

Etymology.—From Chumashans, a tribe of Indians of southern California, including those of the Santa Barbara mission.

2. *Lithobius sierravagus* sp. nov.

Description.—Chestnut, legs and antennæ lighter, the latter pale distally (specimens from Truckee, Cal.) to mahogany, with the legs and antennæ dark, both legs and antennæ rufous distally (specimens from Oregon City, Oreg.); head and dorsum much roughened, especially so the posterior plates; dorsum glabrous or nearly so; venter very sparsely provided with hairs, the anal and genital segments subdensely so; legs sparsely pilose; antennæ uniformly clothed with fine, straight hairs. Head scarcely wider than long (14:13.5), the portion back of eyes subquadrangular. Antennæ: articles 23–27, rarely 20, except the first ones, short, the ultimate mostly a little shorter than the two preceding together, the number of articles usually in inverse proportion to length of antennæ. Ocelli on each side: 16–21, in 4 curving series, mostly 1+6, 5, 4, 3 or 1+5, 6, 3, 2. Prosternal teeth: 8–8 to 13–13, black and conical. Spines of the first legs 2, 3, 2; penult

legs with 3 claws, spines 1, 3, 3, 2; anal legs with the claw single, sometimes with a short spine on the outer ventral surface of base of claw, spines 1, 3, 2, 1; last 2 pairs of coxæ armed beneath and laterally. Coxal pores numerous, in 3-4 series, of varying sizes. Gonopods of ♀: claws short and stout, tripartite, the lobes short and blunt or rounded, the lateral ones sometimes scarcely indicated; basal spines 3-3, moderate, conical.

Length of body 20-24 mm.; width of 8th dorsal plate 2.4(♀)-3.9 mm. (♂); length of antennæ 10-12 mm. (♀), 11-16 mm. (♂); length of anal legs 10-12 mm.

Habitat.—Truckee and Shasta Springs, Cal., and Oregon City and Portland, Oreg.

Etymology.—*Sierra* from Sierra Nevada Mountains, the home of the species, and Latin *vagus*, participle of *vagari*, to roam or wander over.

3. *Lithobius angelus* sp. nov.

Description.—Reddish-brown, legs paler, antennæ light distally; dorsal plates somewhat coarsely punctate, the posterior ones more strongly so; dorsum glabrous; venter mostly nearly glabrous, but the posterior plates and the genital and anal segments with more numerous hairs; legs sparsely pilose, antennæ densely pilose. Head wider than long (7.5:7) (♂), or subequal in length and width (♀). Antennæ: articles 26(♂)-28 (♀), articles short, the ultimate about equal in length to the two preceding together. Ocelli on each side: 12 in 3 longitudinal series (1+3, 4, 4). Prosternal teeth 2-2, acute. Spines of the first legs 1, 3, 1-1, 3, 2; penult legs with 2 claws, spines 1, 3, 3, 1; anal legs with 2 claws, spines 1, 3, 2, 1. Posterior coxæ armed neither *beneath nor laterally*. Coxal pores 5, 5, 5 (6), 5, round or suboval. Gonopods of ♀: claw tripartite; basal spines 2-2, rather stout.

Length of body 14 mm. (♂)-15 mm. (♀); width of 8th dorsal plate 1.9 mm.(♂)-1.7 (♀); length of antennæ 4.5 mm.(♀)-5 mm. (♂).

Habitat.—Los Angeles county, Cal.

Etymology.—Latin *angelus*, an angel, the reference being to the locality where found, Los Angeles, "place of angels."

4. *Lithobius bellulus* sp. nov.

Description.—Body shining testaceous-brown of a reddish tint, head with lower portion of antennæ and the posterior dorsal plates darker; legs paler, with a violaceous tinge, legs and antennæ lighter colored distally; head and anterior dorsal plates weakly finely roughened, the posterior dorsal plates more strongly so; head and dorsal

plates with a few scattered hairs, more numerous on posterior plates; venter likewise nearly glabrous, except the last plates; antennæ uniformly clothed with straight slender hairs of moderate length. Head but little wider than long (10:9). Antennæ: articles 39-44, mostly very short, the ultimate about equal in length to the two preceding taken together. Ocelli on each side: 11-13, arranged in 3 series (1+3, 4, 3-1+4, 4, 4), somewhat distant from each other. Prosternal teeth: 4-4, the 2 inner on each side rather closer together than others. Spines of the first legs 1, 3, 1; penult legs with 2 claws, spines 1, 3, 3, 2; anal legs with 2 claws, spines 1, 3, 3, 1; last 3 pairs of coxæ armed laterally with a stout spine, unarmed below or above. Coxal pores round, moderately large, 5, 5, 5, 4-5, 6, 6, 4 (5). Gonopods of ♀: claw broad, tripartite, the middle lobe longest, slender and acute, the side lobes short; basal spines 2-2, the outer stouter than the inner and flattened distally.

Length of body 13-16 mm.; width of 8th plate 1.6-2 mm.; length of antennæ 6.3-8 mm.; length of anal legs 5.4-7 mm.

Habitat.—Portland., Oreg.

Etymology.—Latin *bellulus*, of pleasing appearance, graceful.

5. *Lithobius remex* sp. nov.

Description.—Body brown, legs paler; head smooth; dorsal plates nearly smooth, a little roughened by weak longitudinal folds; head with a few long hairs; dorsum with scattered short hairs; ventral plates smooth and glabrous; legs sparsely pilose; antennæ rather sparsely clothed with moderately long straight hairs; prosternum with a few hairs about margin; claws of prehensorial feet with long hairs at base. Head cordate, slightly wider than long. Antennæ: articles 20, beyond the second short, except the ultimate which is long, nearly equaling in length the three preceding together. Ocelli on each side: 6, arranged in 2 series (1+2, 3), deeply pigmented. Prosternal teeth 2-2. Spines of the first legs 1, 2, 1; anal legs with the claw single, spines 1, 3, 2, 0, in the ♂ conspicuously expanded in a subvertical direction, the plane of flattening more nearly horizontal distally, not produced into lobes or knots; posterior pairs of coxæ without trace of spines. Coxal pores: pore-bearing groove deep, so that the pores are often visible with difficulty from below, 3, 4, 4, 3, moderate.

Length of body 8 mm.; width of 8th dorsal plate 1.1 mm.; length of antennæ 2.9 mm.; length of anal legs 2.9 mm.

Habitat.—Shasta Springs, Cal.

Etymology.—Latin *remex*, an oarsman, the reference being to the flattened anal legs of the ♂.

6. *Lithobius pitophilus* sp. nov.

Descriptions.—Brown or chestnut, legs and ventral surface paler, antennæ rufous at tips; dorsal plates smooth, with a few shallow longitudinal furrows, glabrous; legs and prehensorial jaws sparsely pilose; antennæ moderately densely pilose. Head subcordate, wider than long (7.25:6.75, nearly). Antennæ with 20 articles, the ultimate mostly shorter than the two preceding together. Ocelli on each side: 12-13 in 3 series (1+3, 5, 3, 4). Prosternal teeth 2-2, acute. Spines of first legs 2, 3, 2; penult legs having the claw with 2 accessory spines, spines 1, 3, 3, 2; anal legs with the claw unarmed, spines 1, 3, 2, 0, femur in ♂ enlarged distally and the tibial and tarsal joints inflated; posterior coxæ unarmed beneath, the last 3 armed dorsally and laterally toward the dorsal surface. Coxal pores 4, 4, 5, 4-4, 5, 5, 5, small and round. Gonopods of ♀: claw weakly tripartite or subentire; basal spines 2-2, stout.

Length of body 11.5-13 mm.; width of 8th dorsal plate 1.6-1.8 mm.; length of antennæ 3.5 mm.; length of anal legs 4 mm.

Habitat.—Truckee, Cal.

Etymology.—Greek *πίτος*, pine, and *φιλος*, fond of, loving, *i.e.*, "pine loving," the specimens having been collected in the pine woods about Truckee.

7. *Lithobius sastianus* sp. nov.

Description.—Testaceous-brown, posterior borders of principal dorsal plates mostly darker; legs paler; antennæ brown at base, yellow distally, head and dorsal plates not strongly roughened, the plates with distinct longitudinal rugæ; venter a little roughened; entire body sparsely pilose, the legs more densely so; antennæ moderately densely clothed with long stiff hairs. Head a little wider than long (5.5-5 very nearly). Antennæ: articles 20, short excepting the first few, the ultimate a little longer than the two preceding together. Ocelli on each side: 10, arranged in 3 series (1+4, 3, 2), those of the upper row largest, those of the middle row intermediate. Prosternal teeth 2-2, small. Spines of the first legs 1, 2, 1; penult legs with 1 accessory claw, spines 1, 3, 3, 1; anal legs with the claw unarmed, spines 1, 3, 3, 1; the last 3 pairs of coxæ armed with a spine dorsally, the last 2 also laterally. Coxal pores very small, round, 2, 2, 3, 3-3, 3, 4, 3. Gonopods of ♀: claw tripartite, the lobes all short, not very acutely pointed; basal spines 2-2, acuminate, the two outer longer than the inner ones.

Length of body 8 mm. (♀)-8.5 mm. (♂); width of 8th dorsal plate

1.2 mm. (♂)—1.4 mm. (♀); length of antennæ 2.2 mm. (♀)—2.8 mm. (♂); length of anal legs 2.2 mm. (♀)—2.8 mm. (♂).

Habitat.—Shasta Springs, Cal.

Etymology.—The Sastians or Shastans were a tribe of Indians formerly holding the country about Mt. Shasta, the locality in which the specimens were collected.

8. *Lithobius mesechinus* sp. nov.

Description.—Testaceous-brown, the legs and antennæ yellow, head and dorsal plates smooth or scarcely roughened, glabrous; ventral plates sparsely pilose, the posterior ones more densely so; legs very sparsely pilose; antennæ with the ultimate articles sparsely provided with stiff hairs, elsewhere very nearly glabrous. Head wider than long (7:6.25). Antennæ: articles 19–21, short, the ultimate shorter than the 2 preceding taken together. Ocelli on each side: 13, arranged in 3 series (1+5, 4, 3), pale. Prosternal teeth 2–2, pale, small. Spines of the first legs 1, 3, 1; spines of penult 1, 3, 3, 1–1, 3, 3, 2; anal legs with the claw unarmed, spines 1, 3, 2, 0; last 2 coxæ armed laterally toward dorsum and also dorsally; the median ventral spines of legs conspicuously longer than the others. Gonopods of ♀: claw tripartite, basal spines 2–2, acute.

Length of body 9–10 mm.; width of 8th dorsal plate 1.5 mm.; length of antennæ 2–3.5 mm.; length of anal legs 3.5 mm.

Habitat.—Meacham, Oreg.

Etymology.—Greek *μεσος*, middle, and *ἔχινος*, a hedgehog, spiny object, etc., so named in reference to the long median ventral spines of the legs.

9. *Lithobius castelopes* sp. nov.

Description.—Brown, legs and antennæ paler, yellowish; head and dorsal plates smooth; head sparsely pilose with moderately long hairs; dorsal plates very sparsely pilose, more especially the posterior ones, particularly about the margins; ventral plates, prosternum and prehensorial feet sparsely pilose, the genital segment nearly glabrous below; legs sparsely pilose; antennæ subdensely clothed with rather long stiff hairs. Head nearly equal in length and width. Antennæ: articles 20, mostly short, the ultimate equal to or a little longer than the two preceding taken together. Ocelli on each side: 12, in 3 series (1+5, 4, 2). Prosternal teeth 2–2, small. Spines of the first legs 1, 3, 2–2, 3, 2; penult legs having the claw armed with 2 accessory spines or claws,

spines 1, 3, 3, 1; anal legs with the claw unarmed, spines 1, 3, 2, 0, in the ♂ much modified, enlarged, the tibia above at the distal end produced into a large knotty lobe, the lobe truncated posteriorly, sparsely pilose, bearing upon its posterior surface a spine which projects caudally; the last 2 pairs of coxæ armed laterally, the last 3 dorsally. Coxal pores very small, 2, 3, 3, 2

Length of body 8.8 mm.; width of 8th dorsal plate 1.3 mm.; length of antennæ 3 mm.; length of anal legs 3 mm.

Habitat.—Shasta Springs, Cal.

Etymology.—Latin *castellum*, a citadel or fortified place, and *pes*, foot, a name suggested by the appearance of the enlargement on the tibia of the ♂ anal legs.

10. *Lithobius clavigerens* sp. nov.

Description.—Color of body, antennæ and last pair of legs brown, other legs yellowish; head and dorsum smooth and glabrous, the head sparsely minutely punctate; ventral plates and the prosternum with prehensorial feet smooth, sparsely pilose, the last 2 together with the genital and anal segments subdensely pilose; antennæ pilose, the outer surface of the proximal articles subglabrous. Head sub-round, about equal in length and width, narrowed anteriorly. Antennæ: articles 20, the ultimate about equaling in length the 2 preceding taken together. Ocelli: 10–14, pale and distinct, in 3 series (1+5, 5, 3). Prosternal teeth 2–2, moderately small. Spines of the first legs 1, 3, 2, penult legs with 1 accessory claw, spines 1, 3, 3, 1; anal legs with the claw unarmed, spines 1, 3, 2, 0. Anal legs in ♀ scarcely more slender than in ♂; the exterior and interior superior margins of tibial and tarsal joints extended laterally, making the upper surface flat, the femur compressed in a different plane; the tibia densely punctate beneath, the tarsal joints less densely so; the first tarsal joint with a knob-like swelling at proximal end (absent in ♂); penult legs similarly modified to anal and to a scarcely smaller degree. In the ♂ the anal legs are also swollen along or a little below the superior margins, but the expanded portions are thicker and not so suggestive of flattening; tibia marked above for its entire length by a ridge-like swelling which at the proximal end is produced upward and inward into a conspicuous pilose lobe, tibia sparsely punctate beneath, the tarsal joints more densely so; in the penult legs the tibia is somewhat similarly modified to that of the anal legs, but the lobe at the proximal end is missing, not so strongly modified as in ♀. Coxal pores small and round, 3, 4, 4, 3. Gonopods of ♀: claw rather large, tripartite, lobes all acute,

the middle one much longest; basal spines 2-2, moderate, subequal, or the inner ones a little longer.

Length of body 10.5-11 mm.; width of 8th dorsal plate 1.4-1.5 mm.; length of antennæ and of anal legs each 4 mm.

Habitat.—Pacific Grove, Cal.

Etymology.—Latin *clavis*, a club, and *gerens*, participle of *gerere*, to bear; so named because the swelling on the dorsal surface of the tibia in the ♂ anal legs suggests a club with the large end placed proximally.